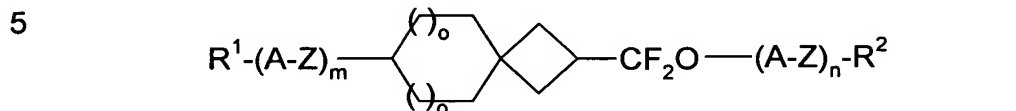



## Patent Claims

1. Cyclobutane derivatives of the formula I



in which

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$R^1, R^2$  are identical or different and each, independently of one another, denote H, halogen (F, Cl, Br or I) or a linear or branched, optionally chiral alkyl or alkoxy radical having 1 to 15 C atoms which is unsubstituted or mono- or polysubstituted by halogen and in which one or more  $CH_2$  groups may each be replaced, independently of one another, by  $-O-$ ,  $-S-$ ,  $-CO-$ ,  $-CO-O-$ ,  $-O-CO-$ ,  $-O-CO-O-$ ,  $-CH=CH-$ ,  $-CH=CF-$ ,  $-CF=CF-$ ,  $-C\equiv C-$  or  in such a way that heteroatoms are not linked directly to one another,  $-CN$ ,  $-SCN$ ,  $-NCS$ ,  $-SF_5$ ,  $-SCF_3$ ,  $-CF_3$ ,  $-CF=CF_2$ ,  $-CF_2CF_2CF_3$ ,  $-OCF_3$ ,  $-OCHF_2$ ,  $-CF_2CH_2CF_3$  or  $-OCH_2CF_2CHFCH_3$ ,

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A is identical or different and in each case, independently of one another, denotes

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a) trans-1,4-cyclohexylene, in which, in addition, one or more non-adjacent CH<sub>2</sub> groups may be replaced by -O- and/or -S- and in which, in addition, one or more H atoms may be replaced by F,

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b) 1,4-phenylene, in which one or two CH groups may be replaced by N and in which, in addition, one or more H atoms may be replaced by halogen

(F, Cl, Br or I), -CN, -CH<sub>3</sub>, -CHF<sub>2</sub>, -CH<sub>2</sub>F, -OCH<sub>3</sub>,  
-OCHF<sub>2</sub> or -OCF<sub>3</sub>,

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c) a radical from the group bicyclo[1.1.1]pentane-1,3-diyl, bicyclo[2.2.2]octane-1,4-diyl, spiro[3.3]heptane-2,6-diyl, naphthalene-2,6-diyl, decahydronaphthalene-2,6-diyl, 1,2,3,4-tetrahydronaphthalene-2,6-diyl and piperidine-1,4-diyl, or

10

d) 1,4-cyclohexenylene,

Z

is identical or different and in each case, independently of one another, denotes -O-, -CH<sub>2</sub>O-, -OCH<sub>2</sub>-, -CO-O-, -O-CO-, -CF<sub>2</sub>O-, -OCF<sub>2</sub>-, -CF<sub>2</sub>CF<sub>2</sub>-, -CH<sub>2</sub>CF<sub>2</sub>-, -CF<sub>2</sub>CH<sub>2</sub>-, -CH<sub>2</sub>CH<sub>2</sub>-, -CH=CH-, -CH=CF-, -CF=CH-, -CF=CF-, -CF=CF-COO-, -O-CO-CF=CF-, -C≡C- or a single bond,

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m, n

are identical or different and, independently of one another, denote 0, 1 or 2, and

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o

denotes 0 or 1.

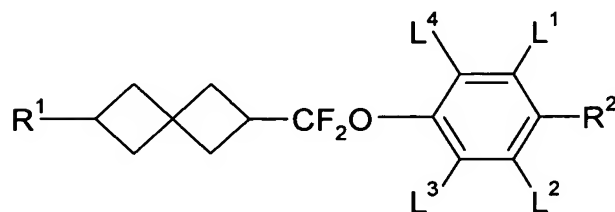
2. Compounds according to Claim 1, characterised in that both o denote 0.

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3. Compounds according to Claim 1, characterised in that both o denote 1.

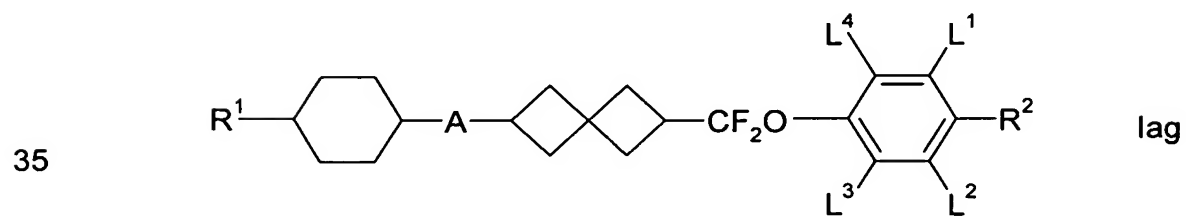
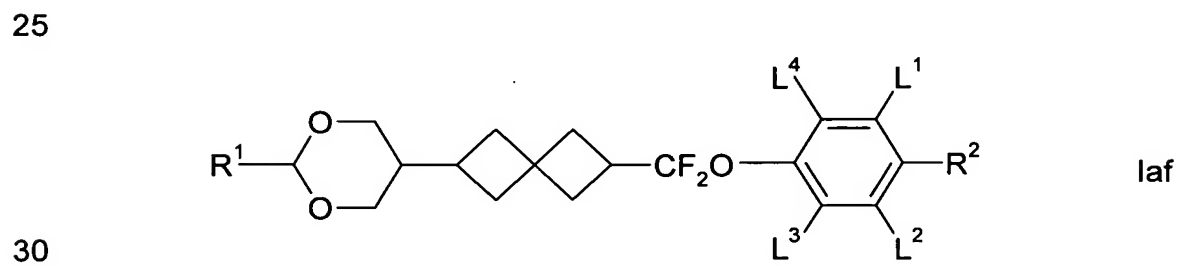
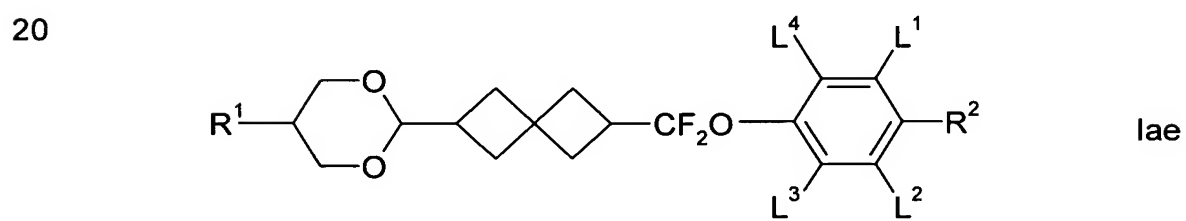
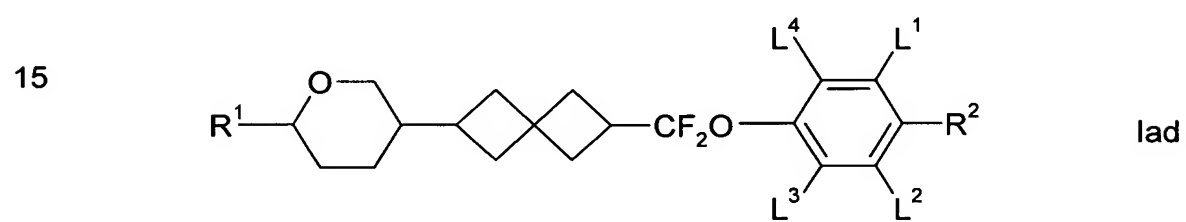
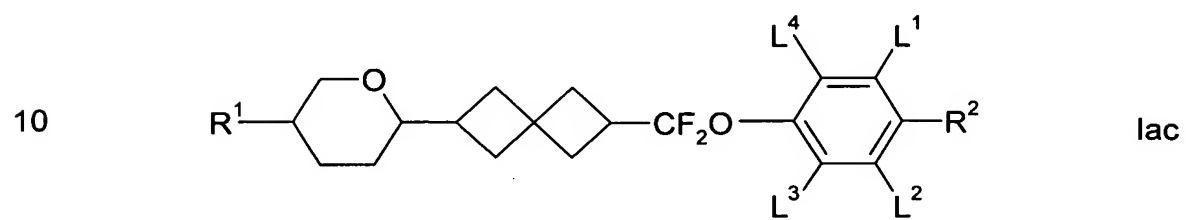
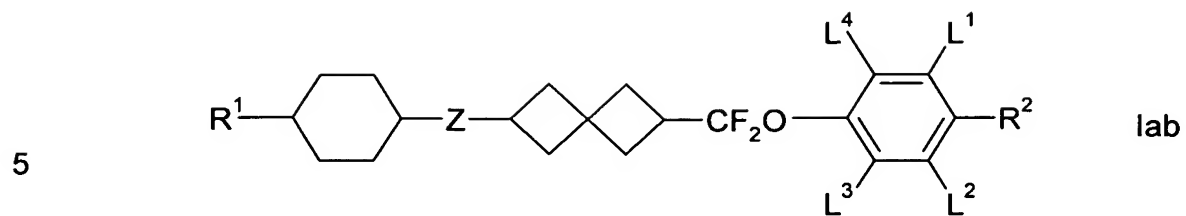
4. Compounds according to Claim 2, characterised in that they have one of the following formulae:

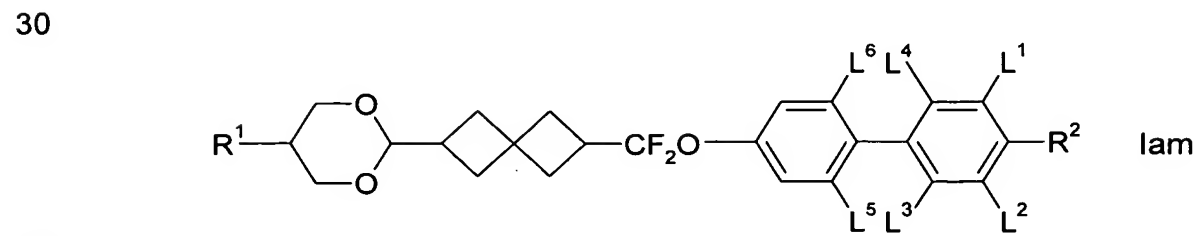
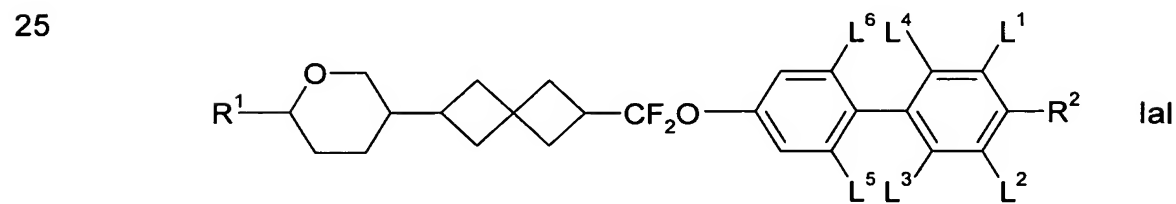
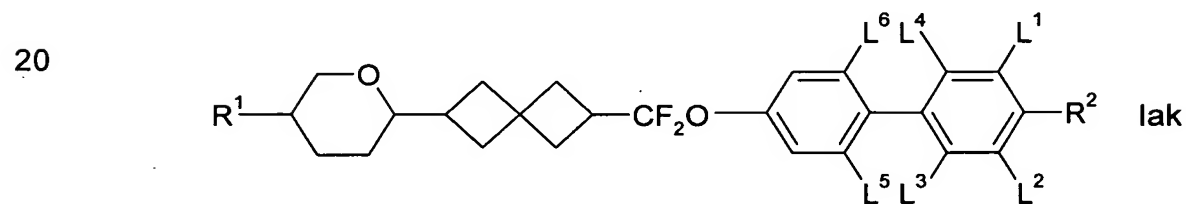
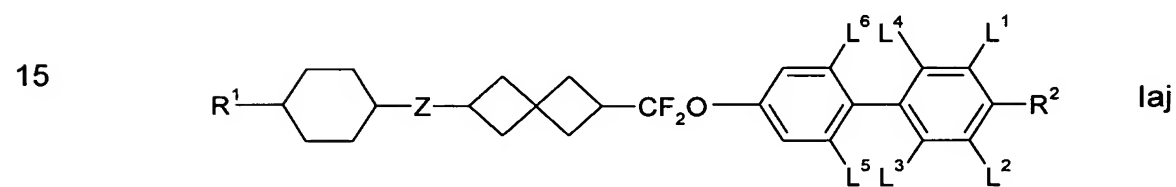
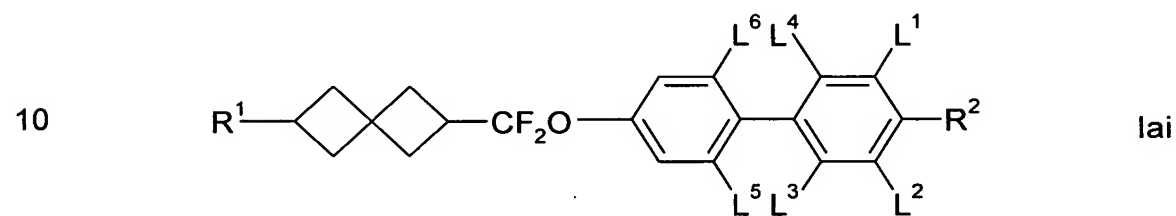
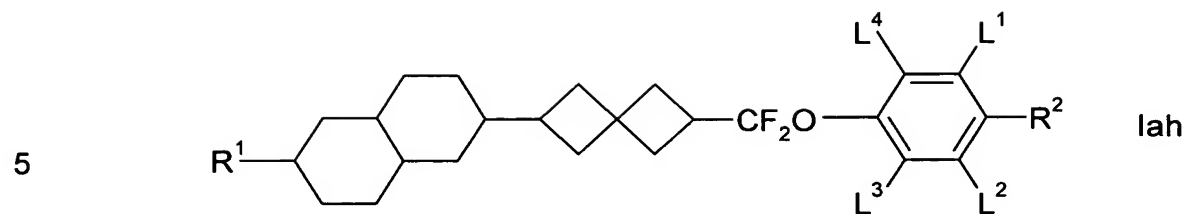
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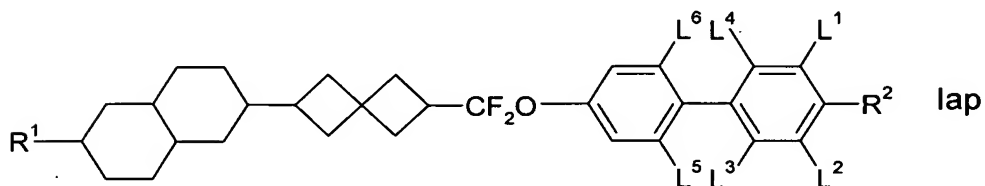
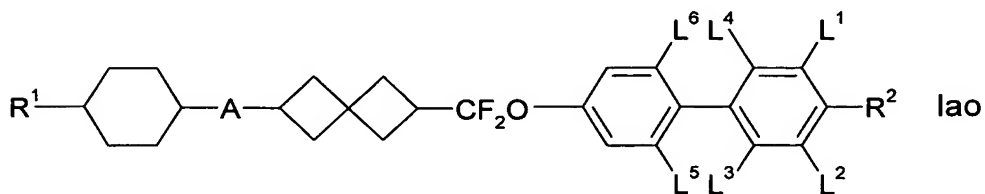
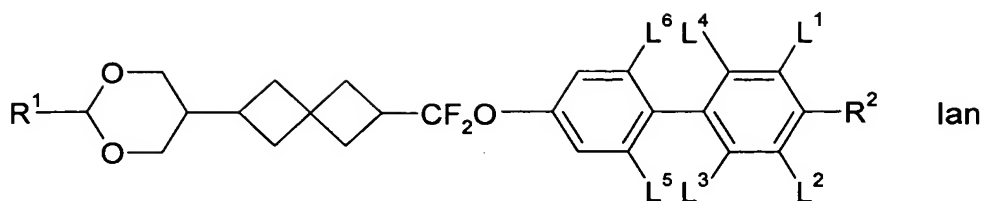


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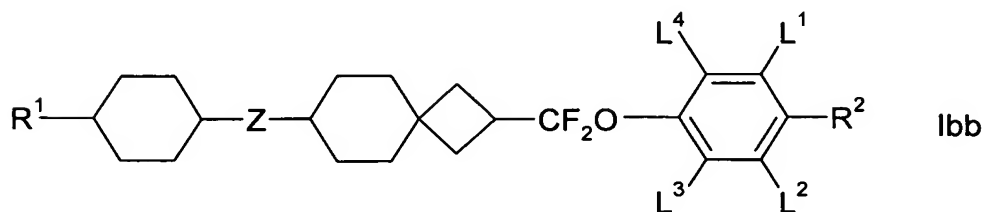
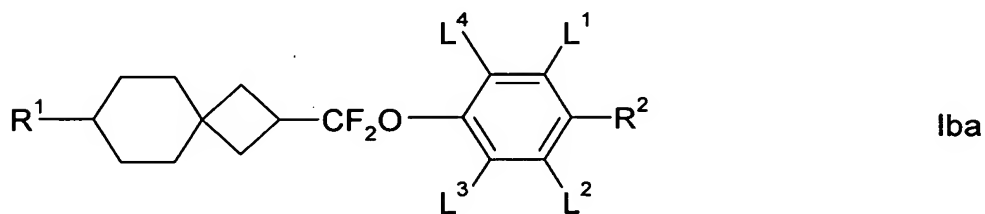




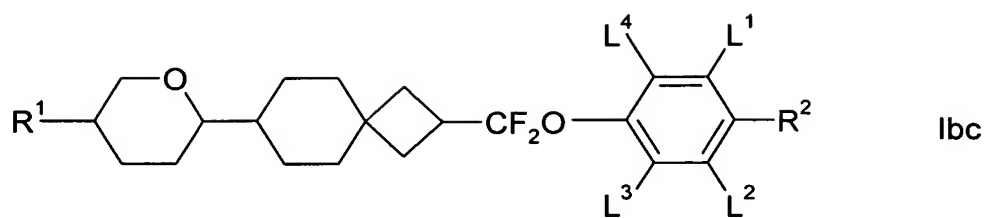


in which  $L^1$ ,  $L^2$ ,  $L^3$ ,  $L^4$ ,  $L^5$  and  $L^6$ , are identical or different and, independently of one another, denote H or F.

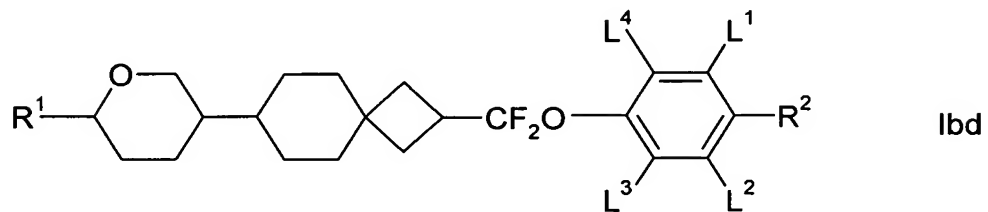
5. Compounds according to Claim 3, characterised in that they have one of the following formulae:



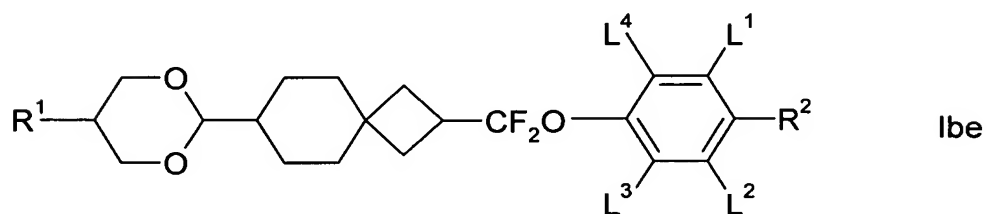
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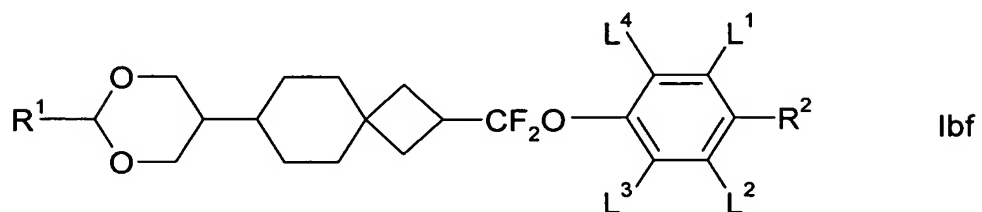
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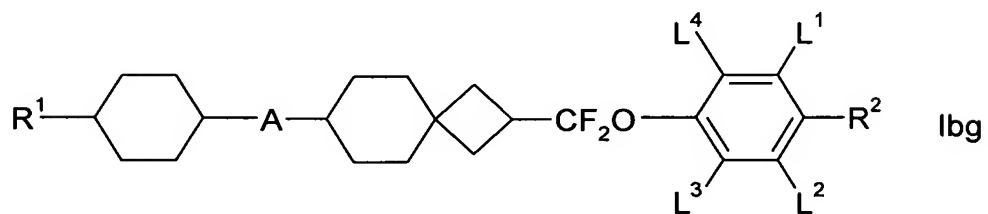
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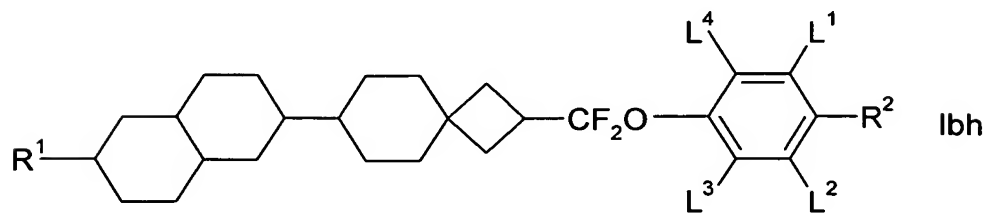
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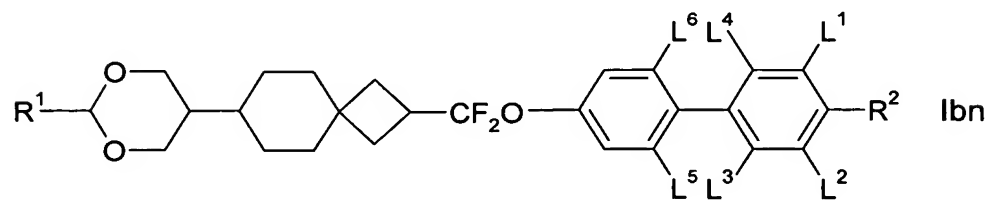
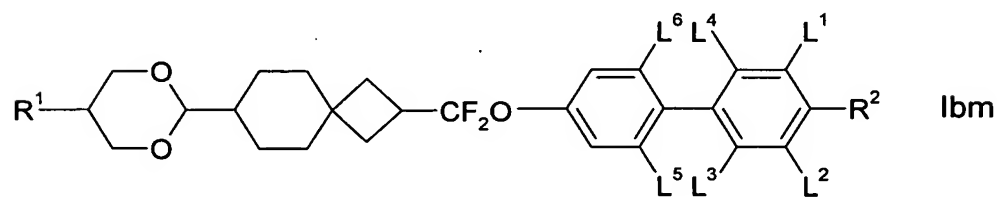
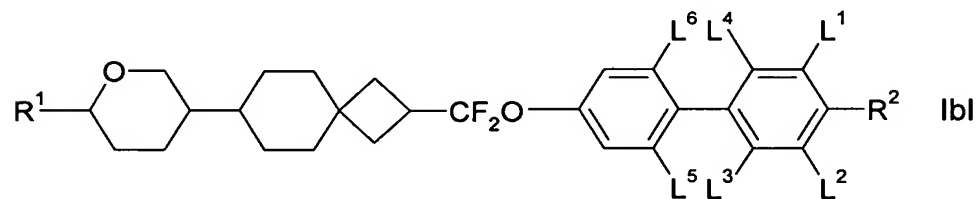
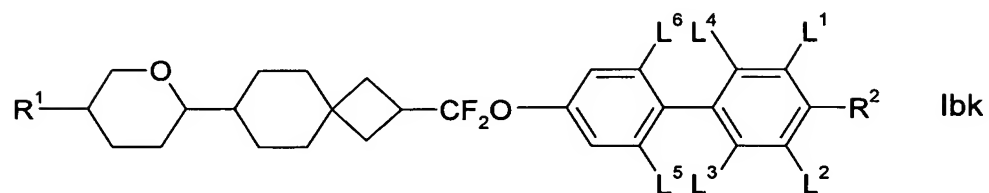
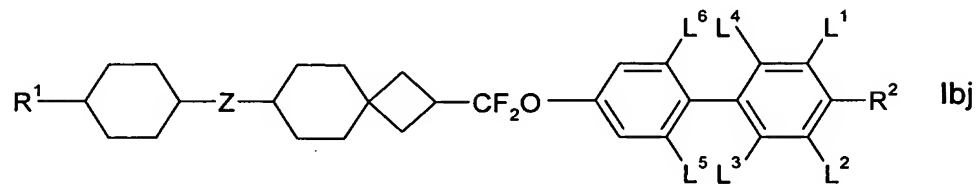
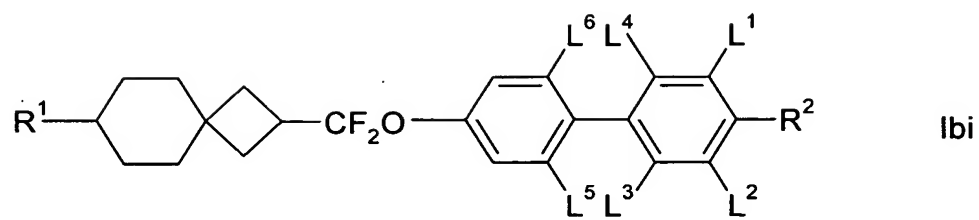
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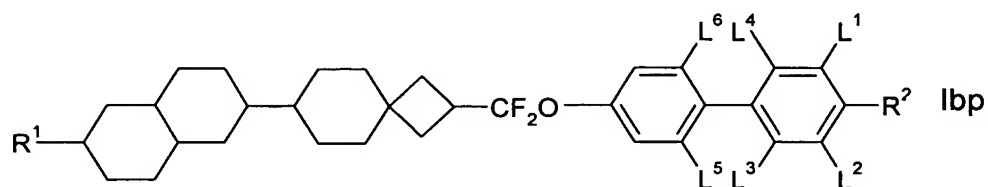
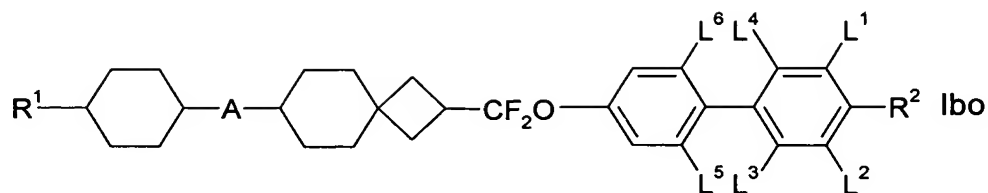


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in which L<sup>1</sup>, L<sup>2</sup>, L<sup>3</sup>, L<sup>4</sup>, L<sup>5</sup> and L<sup>6</sup>, are identical or different and, independently of one another, denote H or F.

- 15 6. Compounds according to at least one of the preceding claims, characterised in that R<sup>1</sup> denotes H or a linear alkyl radical having 1 to 10 C atoms.
- 20 7. Compounds according to at least one of the preceding claims, characterised in that R<sup>2</sup> denotes H, a linear alkoxy radical having 1 to 10 C atoms, -F, -Cl, -CF<sub>3</sub>, -OCF<sub>3</sub>, -OCHF<sub>2</sub>, -CN, -NCS or -SF<sub>5</sub>.
- 25 8. Use of compounds of the formula I according to at least one of the preceding claims as component(s) of liquid-crystalline media.
9. Liquid-crystalline medium having at least two liquid-crystalline components, characterised in that it comprises at least one compound of the formula I according to at least one of Claims 1 to 7.
- 30 10. Liquid-crystal display element, characterised in that it contains, as dielectric, a liquid-crystalline medium according to Claim 9.
- 35 11. Reflective or transfective liquid-crystal display element, characterised in that it contains, as dielectric, a liquid-crystalline medium according to Claim 9.



12. Electro-optical display element, characterised in that it contains, as dielectric, a liquid-crystalline medium according to Claim 9.

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